

What is claimed is:

1. A fluid ejection device, comprising:
a die including a plurality of nozzles variously configured according to a predetermined intended distribution; and
5 a controller configured to set a mean drop volume provided by the plurality of nozzles by selectively firing selected nozzles.
2. The fluid ejection device of claim 1, wherein the predetermined intended distribution is characterized by a random distribution of nozzle sizes.
- 10 3. The fluid ejection device of claim 1, wherein the predetermined intended distribution is based on a uniform distribution of nozzle sizes.
4. The fluid ejection device of claim 1, wherein the predetermined
15 intended distribution is based on a normal distribution of nozzle sizes.
5. The fluid ejection device of claim 1, wherein the predetermined intended distribution is based on a binary distribution of nozzle sizes.
- 20 6. The fluid ejection device of claim 1, wherein a subset of the nozzles are sized larger than others of the plurality of nozzles, and wherein the controller sets the mean drop volume to a low mean drop volume by selectively firing nozzles of the subset.
- 25 7. The fluid ejection device of claim 1, wherein a subset of the nozzles are sized smaller than other of the plurality of nozzles, and wherein the controller sets the mean drop volume to a high mean drop volume by selectively firing nozzles of the subset.

8. The fluid ejection device of claim 1, wherein the controller is configured to set the mean drop volume of the die by selectively firing a subset of commonly sized nozzles.

5 9. The fluid ejection device of claim 1, wherein the plurality of nozzles are arranged on the die so that large nozzles are intermixed with small nozzles.

10 10. The fluid ejection device of claim 9, wherein the plurality of nozzles are arranged on the die so that large nozzles are pseudorandomly intermixed with small nozzles.

11. The fluid ejection device of claim 9, wherein the plurality of nozzles are arranged to avoid visually perceptible printing artifacts.

15 12. A fluid ejection system, comprising:
a die including a plurality of nozzles variously configured according to a predetermined intended distribution; and
a control system configured to set a mean drop volume provided by the plurality of nozzles by selectively firing selected nozzles.

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13. The fluid ejection system of claim 12, wherein the predetermined intended distribution is characterized by a random distribution of nozzle sizes.

25 14. The fluid ejection system of claim 12, wherein the predetermined intended distribution is based on a uniform distribution of nozzle sizes.

15. The fluid ejection system of claim 12, wherein the predetermined intended distribution is based on a normal distribution of nozzle sizes.

16. The fluid ejection system of claim 12, wherein the predetermined intended distribution is based on a binary distribution of nozzle sizes.

5 17. The fluid ejection system of claim 12, wherein a subset of the nozzles are sized larger than others of the plurality of nozzles, and wherein the control system sets the mean drop volume to a low mean drop volume by selectively firing nozzles of the subset.

10 18. The fluid ejection system of claim 12, wherein a subset of the nozzles are sized smaller than other of the plurality of nozzles, and wherein the control system sets the mean drop volume to a high mean drop volume by selectively firing nozzles of the subset.

15 19. The fluid ejection system of claim 12, wherein the control system is configured to set the mean drop volume of the die by selectively firing a subset of commonly sized nozzles.

20 20. The fluid ejection system of claim 12, wherein the plurality of nozzles are arranged on the die so that large nozzles are intermixed with small nozzles.

25 21. The fluid ejection system of claim 20, wherein the plurality of nozzles are arranged on the die so that large nozzles are pseudorandomly intermixed with small nozzles.

22. The fluid ejection system of claim 20, wherein the plurality of nozzles are arranged to avoid visually perceptible printing artifacts.

23. A fluid ejection device, comprising:

a die including a plurality of nozzles configured with various intended sizes, wherein the intended size of each nozzle is selected according to a predetermined intended distribution that defines at least a boundary interval of intended nozzle sizes and a probability distribution of intended nozzle sizes; and

a control system configured to set a mean drop volume of the die by selectively firing selected nozzles of the die.

24. The fluid ejection device of claim 23, wherein the predetermined intended distribution defines a uniform probability distribution of intended nozzle sizes.

25. The fluid ejection device of claim 23, wherein the predetermined intended distribution defines a normal probability distribution of intended nozzle sizes.

26. The fluid ejection device of claim 23, wherein the predetermined intended distribution defines a binary probability distribution of intended nozzle sizes.

27. The fluid ejection device of claim 23, wherein the boundary interval includes a subinterval of large intended nozzle sizes, and wherein the control system sets the mean drop volume to a low mean drop volume by selectively firing nozzles sized in the subinterval of large intended nozzle sizes.

28. The fluid ejection device of claim 23, wherein the boundary interval includes a subinterval of small intended nozzle sizes, and wherein the control system sets the mean drop volume to a high mean drop volume by selectively firing nozzles sized in the subinterval of small intended nozzle sizes.

29. The fluid ejection device of claim 23, wherein the control system is configured to set the mean drop volume of the die by selectively firing nozzles in a subinterval of intended nozzle sizes.

5 30. The fluid ejection device of claim 24, wherein the plurality of nozzles are arranged on the die so that nozzles having large intended sizes are intermixed with nozzles having small intended sizes.

 31. A fluid ejection device, comprising:
10 a die including a plurality of nozzles configured to eject printing fluid, wherein an intended drop volume of printing fluid ejected from each nozzle is derived from a predetermined intended distribution; and
 a control system configured to set a mean drop volume of the die by selectively firing selected nozzles of the die.

15 32. A method of equalizing the mean drop volume of a printing bar, wherein the printing bar includes at least a first die and a second die, the method comprising:

 designing the first die with a plurality of nozzles having various intended
20 sizes based on a predetermined intended distribution;

 designing the second die with a plurality of nozzles having various intended sizes based on a predetermined intended distribution;

 printing a test swath from the first die;

 printing a test swath from the second die;

25 comparing the apparent density of the test swath from the first die with the apparent density of the test swath from the second die;

 setting the mean drop volume of the first die to match the mean drop volume of the second die by selectively firing a subinterval of nozzles of the first die.

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33. The method of claim 32, wherein setting the mean drop volume of the first die includes selectively firing a subinterval of nozzles having large intended sizes to set the mean drop volume to a low mean drop volume.

5 34. The method of claim 32, wherein setting the mean drop volume of the first die includes selectively firing a subinterval of nozzles having small intended sizes to set the mean drop volume to a high mean drop volume.

10 35. A method of equalizing the mean drop volume of a first die and a second die, the method comprising:

designing the first printhead with a plurality of nozzles having various intended sizes based on a predetermined intended distribution;

designing the second printhead with a plurality of nozzles having various intended sizes based on a predetermined intended distribution;

15 printing a test swath from the first printhead;

printing a test swath from the second printhead;

comparing the apparent density of the test swath from the first printhead with the apparent density of the test swath from the second printhead;

20 setting the mean drop volume of the first printhead to match the mean drop volume of the second printhead by selectively firing a subinterval of nozzles of the first printhead.

36. A printhead die, comprising:

a first group of nozzles having a first nozzle size; and

25 a second group of nozzles having a second nozzle size different than the first nozzle size,

wherein a number of the first group of nozzles and the second group of nozzles are determined according to a predetermined intended distribution.

37. The printhead die of claim 37, wherein the predetermined intended distribution is characterized by a random distribution.

38. The printhead die of claim 37, wherein the predetermined intended
5 distribution is based on a uniform distribution.

39. The printhead die of claim 37, wherein the predetermined intended distribution is based on a normal distribution.

10 40. The printhead die of claim 37, wherein the predetermined intended distribution is based on a binary distribution.

41. The printhead die of claim 37, further comprising a third group of nozzles having a third nozzle size different than both the first and second nozzle
15 size and wherein a number of the third group of nozzles is determined according to the predetermined intended distribution.

42. The printhead die of claim 37, wherein a location of each of the first group of nozzles and each of the second group of nozzles is determine based
20 upon the predetermined intended distribution.

43. The printhead die of claim 37, wherein the first group of nozzles and the second group of nozzles are intermixed in location.

25 44. The printhead die of claim 37, wherein the location of the first group of nozzles and the second group of nozzles are arranged to be pseudorandomly intermixed.

30 45. The printhead die of claim 37, wherein the location of the first group of nozzles and the second group of nozzles are arranged to avoid visually perceptible printing artifacts.